

The Mining Journal

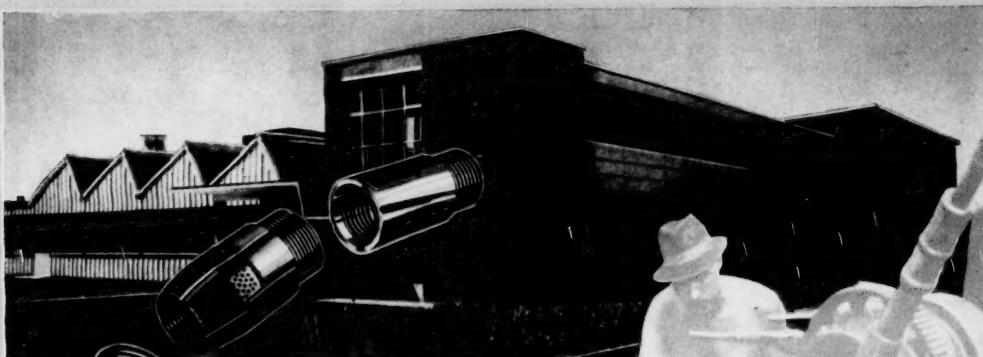
Established 1835

Railway & Commercial Gazette

Vol. CCXXXVIII No. 666

LONDON, FEBRUARY 29, 1952

PRICE 8d

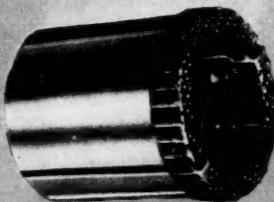
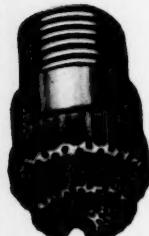


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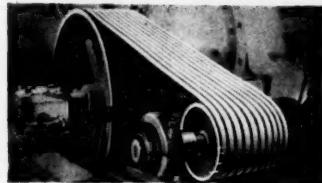
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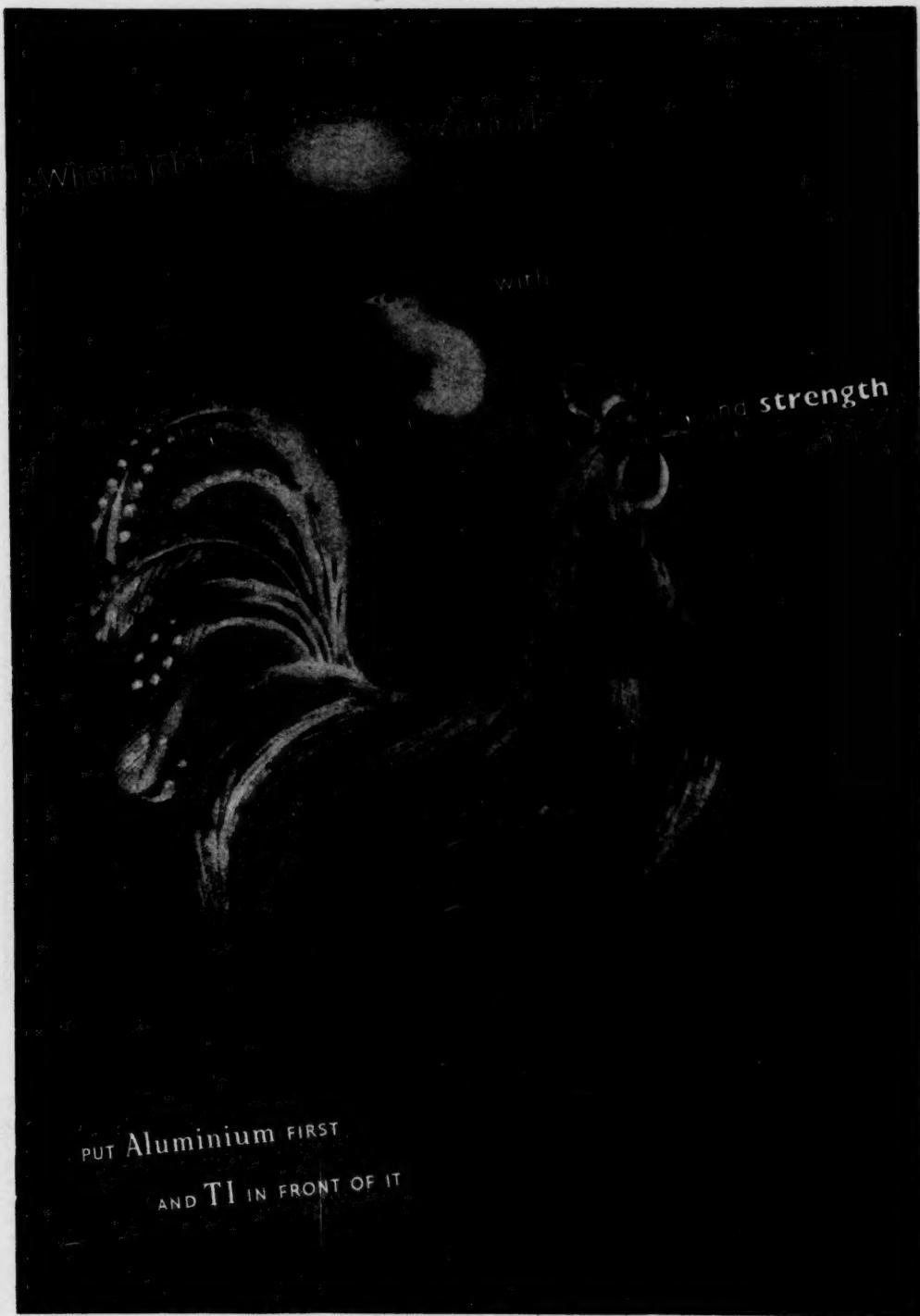


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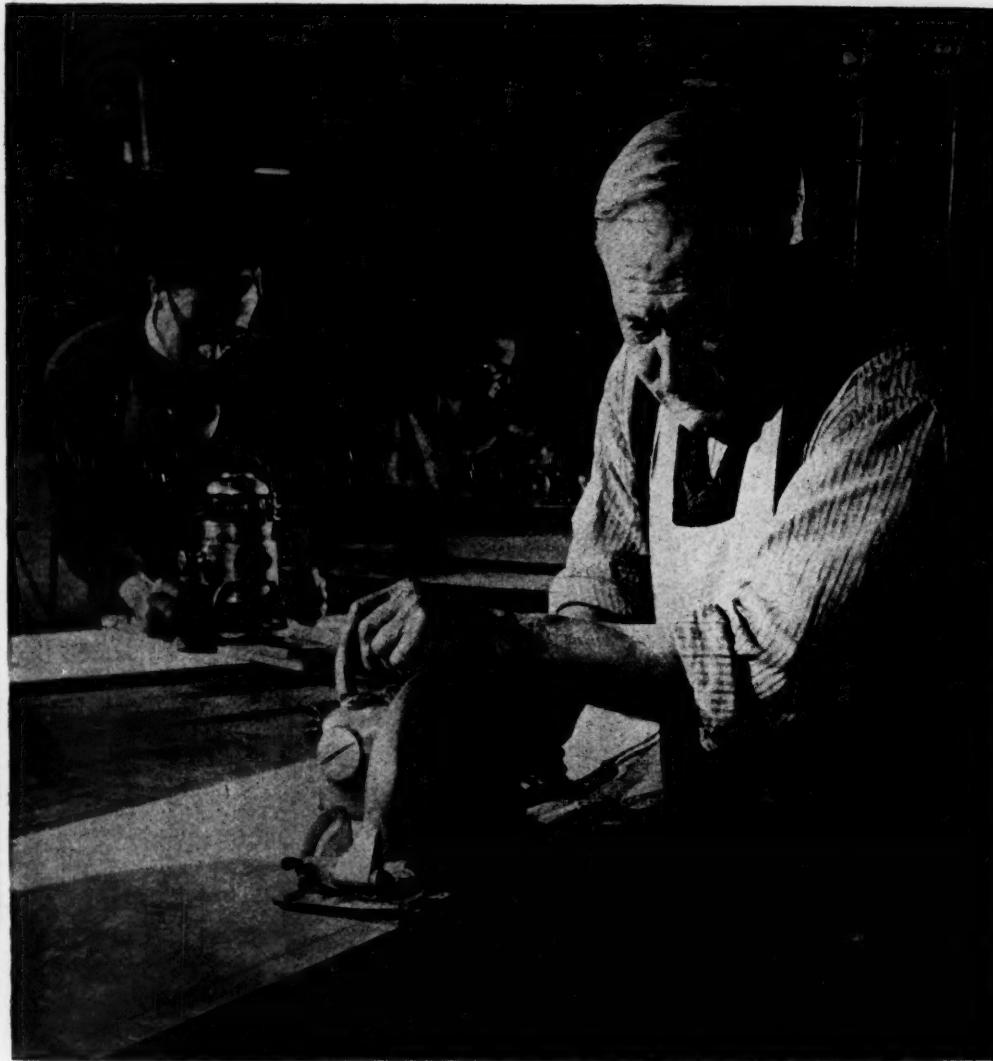
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The Mining Journal

Established 1835

Vol. CCXXXVIII No. 6080

LONDON, FEBRUARY 29, 1952

Price 8d

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Published by The Mining Journal Ltd. at 15, George Street, London, E.C.4.

NOTES AND COMMENTS

Will Asbestos Become S. Rhodesia's Foremost Mineral?

The increasingly important rôle asbestos appears to be destined to play in the mineral industry and export trade of Southern Rhodesia has frequently been referred to in *The Mining Journal*. This importance has also been emphasized by the aid given by the former E.C.A. to three Rhodesian asbestos mining companies to finance their development and exploitation programme—the first time that this organization had granted aid to a South African mining enterprise engaged exclusively in the production of asbestos. Reference was also made in these columns to the interesting fact that the colony's asbestos output was rapidly overtaking gold in value. This development has been the result of two factors: the higher market value of the fibre and the higher total output, aided by mechanization, which is reported to have increased output per man by nearly 50 per cent.

In this connection, it is of interest to note that a gradual change from gold to asbestos production will be considered by the Antelope Mine when the results of further investigations of serpentine deposits on its property will have become available in about six months. This view was expressed in an interview by Mr. M. C. G. Meyer, consulting engineer to the General Mining and Finance Corporation. Meanwhile, however, development work for gold is continuing.

Gold mining operations had, according to Mr. Meyer, exposed chrysotile asbestos in the serpentine bodies in various positions of the mine over a period of years, and there were surface exposures on other claims on the extensive property. On the Yadkin section, cross fibres were present in workings closed down some years ago and were now being tested by development. At the Antelope Mine itself slip fibres had been exposed, but not developed, between the 12th and 14th levels at depths down to 2,000 ft. Prospecting of the surface exposures was in progress. Samples tested showed that the asbestos, especially the slip fibre, was of good quality, but it was too early to assess the economic importance of the deposits.

Dealing with the question of switching from gold to asbestos, while saying that it could not be decided now, he emphasized that the possibility was very interesting because of the advantages which would accrue from start-

ing asbestos mining with an existing organization and development at depth. Like most Southern Rhodesian gold mines, the Antelope Mine, a medium-size producer with a monthly output of about 600 to 650 oz. of gold, staffed by about 23 Europeans and 450 Natives, had been struggling against rising costs. A switch to the production of asbestos would, therefore, open up interesting prospects for this enterprise.

Further evidence of the interest in asbestos is provided by the entry into South Rhodesia of the Anglo-Rand Mining and Finance Corporation Ltd., which has taken over the technical control and development of 23 blocks of claims held by the General Asbestos Corporation in the Vukwe hills, near Shabani. Anglo-Rand is already known in Southern Rhodesia as having initiated investigations, with Anglo-Colonial Territories, Ltd., into the Lubimbi coalfields, and Anglo-Colonial is also interested in the agreement with General Asbestos.

Other mining houses from the Union of South Africa, including African and European Investment Co. Ltd., either hold, or have, options or claims adjacent to those of General Asbestos in the Vukwe hills. Bearing in mind the considerable interest that is now being paid in the Union to asbestos development in Southern Rhodesia, the opening up of further asbestos mines appears to be a foregone conclusion. Moreover, it is expected that within 18 months, the Colony's asbestos output, which is valued already at over £5,000,000 yearly, will be increased by 20 per cent. This increased output will not only come from new producers, but also from the established concerns which are working dumps formerly considered as unsuitable.

Important Expansion of Jamaica's Bauxite-Alumina Facilities

An important statement on the expansion of alumina production facilities in Jamaica—the mineral resources of which are described in an article on pp. 220-221—has recently been issued in Montreal by Mr. Nathaniel V. Davis, President of Aluminium Ltd. It reveals that Canadian investment in the Caribbean area will be augmented by at least \$20,000,000 to provide for a large-scale expansion of the bauxite-alumina facilities already under construction in the island. In fact, the company's new

alumina plant, the first in the Caribbean, is now having its planned capacity increased from 180 tonnes of alumina per day to 450 tons per day.

The plant is located near Mandeville, in the south-central section of the island. Construction on the first phase has been proceeding rapidly, providing employment for over 500 workers. Progress to date includes: the erection of structural steel and tanks from material brought from England; calcining kiln in place; the water supply obtained by drilling two wells to a depth of 300 ft. below sea level and the laying of a buried 10 in. pipeline four miles to a 1,000,000 gallon reservoir. Storage facilities for alumina will be provided by two steel silos at Old Harbour Bay, with a capacity of 10,000 tons each. These will be filled by conveyor belts from the railroad cars, and in turn discharged by a 1,400 ft. long conveyor to the pier. Storage tanks will also be provided for 80,000 bbl. of fuel oil to be used for firing both the calcining kilns and steam generating equipment at the alumina plant.

This increase in capacity is required to provide more raw materials for Canada's rapidly expanding aluminium industry. Moreover, a further enlargement of the plant to 670 tonnes per day is called for in the company's plans as a successive development.

To service the plant and deal with exports, a deep-sea port will be created on the south coast of Jamaica and a 600 ft. steel pier will be constructed at Old Harbour Bay, with initial dredging operations to start immediately for a 7,000 ft. channel, 400 ft. wide, with a turning basin of 1,200 ft. This operation, which involves moving 2,250,000 cu. yd. of sand and clay, will take until June, when construction of the pier will commence. The harbour will be connected to the Jamaica Government Railway by a spur line and will have extensive freight sidings.

Total investment by Aluminium Ltd. in Jamaica may go as high as \$40,000,000, including the cost of extensive agricultural projects initiated six years ago. The programme is being carried out by Jamaica Bauxites, Ltd., a subsidiary of Aluminium Ltd. All capital requirements are being provided by the parent company, with the exception of \$6,700,000 towards the cost of the first-stage plant, which was loaned to Jamaica Bauxites, Ltd., by the former E.C.A. This loan is being repaid by aluminium shipments from Canada to the U.S. Government stockpile.

"Production from the alumina plant will go chiefly to the new aluminium smelter being built by our subsidiary, Aluminium Co. of Canada, Ltd., in British Columbia," Mr. Davis said. "The new west-coast smelter, with an initial capacity of 83,000 tonnes of aluminium, will create a considerable increase in Canada's requirements of raw materials. This has resulted in an expansion and acceleration of our construction programme in Jamaica. Savings of about 50 per cent in shipping costs will be realized by extracting the alumina from the bauxite at its source, rather than shipping the ore itself to an alumina plant in North America."

First production of Jamaica alumina is expected to commence in the third quarter of 1952, while the enlarged plant, on which construction is well under way, is scheduled to go into operation late in 1953. At the B.C. smelter, which will be ready for initial operation early in 1954, the alumina will be discharged from deep-sea vessels direct to storages and potlines 800 yards from the wharf.

It may be recalled that the company was the first to acquire bauxite properties in Jamaica and to pioneer geological exploration throughout the island; tests were carried out originally in 1942, and were continued through the ensuing years, both in the field and in Canadian laboratories. The company purchased 30,000 acres of land, containing approximately 5,000 acres of bauxite deposits.

A new method of shipping alumina is planned by the company in order to handle the quantity involved. The material will be discharged directly into the ship's hold in bulk instead of being loaded in bags. This technique will speed up the operation to a rate of 600 tons per hour with considerable saving in handling, shipping time, and bags.

When mining operations are begun, open-pit methods using mechanical excavators will be employed. The bauxite will be transported to the plant by diesel-powered haulage units.

Portugal

(From Our Own Correspondent)

Oporto, February 15

Portugal exported a total of 4,223 tonnes of wolfram concentrates during 1951 compared with 3,206 tonnes in 1950, an increase of 1,017 tonnes. On paper, at any rate, this appears to be a considerable improvement but an analysis of the 1951 total reveals that approximately 600 tonnes of this increase came from the Beralt Tin & Wolfram mines at Panaqueira, so that excluding the additional tonnage produced from this source, the country's average monthly increase compared with 1950 was less than 35 tonnes. This can hardly be described as impressive in view of the high average price which wolfram has commanded throughout the year.

The countries to which wolfram concentrates were exported in November and December of last year, together with the cumulative totals for 1951, are shown in the following table:

Wolfram Concentrates Exported	November (1951) Country	December (1951) (tonnes)	Jan.-Dec. (1951) (tonnes)
U.K.	228	300	2,288
U.S.A.	339	223	1,697
Germany	Nil	56	76
Sweden	26	1	74
France	Nil	Nil	60
Belgium	Nil	Nil	12
Italy	Nil	Nil	11
Others	Nil	Nil	5

Until the closing months of last year it seemed as if the export of tin concentrates would be much less than in 1950 but an unexpected shipment of 122 tonnes to Brazil and of 138 tonnes to Spain helped to raise the total tonnage exported to 1,025 tonnes, a decrease of only 150 tonnes. The principal buyer was the U.K. taking 711 tonnes.

In the following table, figures are given for other Portuguese minerals exported in November and December of last year together with the cumulative totals for 1950 and 1951. A breakdown into countries of the total tonnage exported is also given.

Material Exported	November (1951) (tonnes)	December (1951) (tonnes)	Jan.-Dec. (1951) (tonnes)	Jan.-Dec. (1950) (tonnes)
Tin Concentrates*... White Arsenic.....	191	224	1,025*	1,175
Cupreous Pyrites† ... Manganese Oxide‡ ...	152½	152½	807	1,245
Iron Ore (estimated) —	28,621	81,724	570,939†	497,223
	490	1,331	10,536‡	2,408

* U.K. 711 tonnes; Brazil 138 tonnes; Spain 122 tonnes; U.S.A. 54 tonnes.

† France 229,672 tonnes; Belgium 159,082 tonnes; Germany 73,153 tonnes; Holland 56,812 tonnes; U.K. 17,298 tonnes; others (Denmark, Ireland, North Africa, etc.) 34,918 tonnes.

‡ Believed to be U.S.A.

The Belgian Congo in 1951

(From Our Own Correspondent)

Brussels, February 24

The annual report of the Société Générale throws a good deal of light on recent developments in the Belgian Congo, where this pillar of Belgium's banking institutions is taking an increasing interest.

In a general appraisal of the Belgian Congo during 1951 the Générale report notes that the country continued to benefit from the high prices received for the bulk of its exports—a situation which augurs well for the broadening of its programme of economic expansion and industrialization. In particular, hydro-electric schemes are being pushed ahead not only in Katanga but also in the other provinces where some new power stations are being built and others are being planned. In the mining industry new and improved techniques and equipment enabled output to increase, lower grade ores to be economically extracted and widespread but systematic boring operations to be carried out. The expansion of the electric power capacity will, of course, have a favourable effect on the mining industry and it is hoped to develop an electro-metallurgical industry so that a greater number of the country's ores can be processed into refined metals or into semi-finished products.

Against a wider background the report comments on the present world non-ferrous metal situation stating that prospecting for new deposits has become an urgent necessity in view of the paucity of important discoveries made in recent years and also because of the lack of financial incentive to re-open former workings.

The report deals at some length with the copper and tin production and expresses the opinion that world production of tin and that of the Belgian Congo and Ruanda-Urundi would be much the same as in 1950 when world output totalled 167,000 tons and production from the Congo and Ruanda-Urundi was 14,558 tons.

UNION MINIERE'S ACTIVITIES OUTLINED

In the Congo's mining industry the report gives pride of place to Union Minière du Haut Katanga which during 1951 produced a record tonnage of 191,000 tonnes of copper, exported some 152,000 tons of zinc concentrates having a metal content of 80,000 tons and increased its production of cobalt—although its output of uranium, radium, cadmium and precious metals showed little change compared with the previous year. These commendable results were achieved despite the large development programme the company has in hand which continued to make good progress. Several plant installations were commissioned during the year amongst which the Générale report mentions a washing plant at the Rushi mine; a cobalt "triphasé" furnace at Panda; a cobaltiferous ore crushing plant, an extension to the decantation plant and a copper refining furnace at Shituru. Moreover, the capacity of the Kolwezi concentrator is being raised; the electrification of the transportation system at the Western Mines is being continued; the construction of the Del-commune hydro-electric power station at Zilo is progressing satisfactorily and, the construction of a second hydro-electric power station on the Lualaba, below the Zilo station, to be known as the Le Marinel Power Station, has been agreed upon. Nor does the report omit reference to the company's welfare activities, for good treatment of native labour and their families is the inflexible rule for

European companies operating in the Belgian Congo and Ruanda-Urundi.

The Société Générale's report, to conclude its description of the Congo's mining industry, ranges over a broad field and encompasses the activities of several mining companies, focusing attention on the most important of their recent developments.

The Société Générale Industrielle et Chimique du Katanga ("Sogéchim") during the year continued to extend the capacity of its sulphuric acid plant which will require several years before it is finally completed.

The Société Métallurgique du Katanga ("Métalkat") concentrated its attention on the construction of its zinc works.

The Société de Recherche Minière du Sud-Katanga ("Sudkat") continued to work its Kasekalesa manganese mine and has resumed prospecting in the western end of its concession.

The Société Africaine d'Explosifs ("Afridex") has commissioned a second plant at Manono and it is reported that the improvements to its Kakontwe plant will be completed shortly.

The Société des Ciments Métallurgiques de Jadotville, which the Union Minière helped to establish, will produce cement with the slag obtained from Union Minière's cobalt electric furnaces.

The Luena coalfields increased its output in 1951 and improved its equipment.

The report also recalls the establishment during the year of the *Société des Bitumes et Asphaltes du Congo* to work the discoveries made by the Forminière in the Mayumbe, north of the Lower Congo River.

The Forminière produced 361,000 carats of diamonds—mostly gemstones—and 553 kilograms of gold in 1950 while the *Minière du B.C.K.* in 1951 produced nearly 10,000,000 ct. of diamonds—largely industrial stones—and 70 kilograms of gold.

Bécéka Manganèse commenced production during the year.

Mineral Discoveries Aided by Anglo-Iranian Oil Search

An early resumption of drilling for oil near Ainsdale-on-Sea, Southport, Lancashire, is planned by the D'Arcy Exploration Co. (the prospecting subsidiary of the Anglo-Iranian Oil Company) which, last December, stopped the drilling of a test well there at about 4,300 ft. Information obtained encouraged the choosing of a site two miles further south for the drilling of another well. In this connection the company recalls that in its search for oil in the United Kingdom—which resulted in the discovery of the field at Eakring, Nottinghamshire—it has made important discoveries of other mineral wealth. For instance, to the North and South of Lincoln, and to the East of Nottingham, deep seams of coal have been proved. Geophysical surveys carried out by the company have suggested the prospect of new coalfields between Bath and the Thames Estuary, and between South London and Tonbridge. This information has been passed on to the National Coal Board, and the company has also directly assisted the Board in various ways, such as by surveying their borings by electrical, temperature and gamma ray methods. A particularly important discovery made during drilling operations at Eskdale, Yorkshire, was a large deposit of potash. Careful examination by the company of cores taken while boring for oil was proceeding in 1938 resulted in this discovery.

COLONIAL MINERAL DEVELOPMENT—IV

Jamaica's Mineral Resources

By A. G. THOMSON

In view of the recent development of the extensive bauxite deposits of Jamaica, the following article, the fourth in a series devoted to the mineral wealth of the smaller British overseas territories, assumes more than topical interest.

The island of Jamaica lies practically in the centre of the Caribbean Sea between $17^{\circ} 43'$ and $18^{\circ} 32'$ north latitude and $76^{\circ} 11'$ and $78^{\circ} 21'$ west longitude. It is 148 miles long by 52 miles wide and covers an area of 4,411 sq. miles. Kingston, the seat of Government and largest port, has a population of about 109,000. The eastern portion of the island is traversed by the Blue Mountain Range, which is from 3,000 to 7,000 ft. high, and the central and western portions consist largely of mountain ranges and high limestone plateaux. It is in the pre-white limestone rocks of the Blue Mountain Range that possibilities of important mineral deposits occur.

The mining history of Jamaica goes back to the first half of the 19th century, when mines were opened up by several companies, chiefly for copper and lead. The deposits proved to be small, however, and by 1859, when the first Geological Survey of the island was started by Sawkins and Barrett, all mining activities had been discontinued. In recent years attention has been centred mainly on gypsum, bauxite and phosphates, and a considerable amount of exploration has been carried out by commercial firms. Deposits of gypsum in the Kingston area occupy a belt of about 10 miles in length, and are estimated to contain about 85,000,000 tons of this material.

IMPORTANCE OF BAUXITE DEPOSITS

During the early war years, the activities of German submarines stimulated interest in the possibilities of utilizing Jamaican bauxite to supplement shipments from British Guiana. On November 27, 1942, the Governor of Jamaica, under the Jamaica Emergency (Defence) Acts 1939-40, declared all bauxite to be the property of the Crown. Aluminium Laboratories, Ltd., were appointed agents of the Government to conduct investigations, and extensive exploration work, started early in 1943, soon revealed large reserves of ore. An experimental shipload was sent to North America, but investigations showed that the Jamaican product was too low grade to be used in existing American refining plants without a considerable reduction of production capacity. By that time sinkings by German submarines were becoming less frequent, and it was, therefore, decided to abandon the attempt to develop Jamaican bauxite as a war material.

However, exploration was continued; in October, 1943, Jamaica Bauxites Ltd. was locally registered as a fully-owned subsidiary of Aluminium Ltd., and began to acquire bauxite properties early the following year. In 1945 and 1947, respectively, the Reynolds Metal Co. and the Permanente Metals Corporation also became actively interested in Jamaican bauxite. Several small shipments have been made for experimental purposes, and preparations are now being made for large-scale production. Jamaica Bauxites, Ltd., will process their bauxite to alumina in Jamaica for shipment to their plants in Canada. Further reference is made to this important development on page 217 in this issue.

Extensive bauxite deposits of the *terra rossa* type are found in the White Limestone districts, and have been surveyed over large parts of the island by the companies concerned. Exploration on the properties controlled by the three bauxite companies has, so far, revealed reserves

estimated at not less than 130,000,000 tons on a moisture-free basis.

Though the island has other known mineral resources that merit further investigation, it is only recently that systematic geological surveying has been resumed. The last survey to be completed was carried out between October, 1921 and April, 1924, by C. A. Matley as Government Geologist, and by G. M. Stockley. It was concerned mainly with water supplies, but attention was also devoted to road metals, petroleum, lignite and other metals.

Following a visit from Dr. F. Dixey, C.M.G., O.B.E., Director of the Colonial Geological Surveys and Geological Adviser to the Secretary of State for the Colonies, a new Geological Survey of Jamaica was established in November, 1949. The present staff consists of the Government Geologist, Mr. V. A. Zans, and two geologists, Dr. L. F. Chubb and Mr. H. R. Versey. Operations were started in temporary quarters, but in March last year, the Department moved to larger premises in a new wing of the Institute of Jamaica, where well-equipped laboratories have been provided.

As 26 years had elapsed since the last Survey, an entirely fresh start had to be made, and the first six months were occupied mainly by preliminary work. Several reconnaissance tours were carried out during this period, and from the information obtained, a programme for a systematic survey was drawn up. The present re-mapping is being done on the basis of the new 1:50,000 map sheets of the Colonial Topographic and Geodetic Surveys.

GYPSUM DEPOSITS RECEIVING SPECIAL ATTENTION

The re-survey was started in the Kingston area, special attention being devoted to the gypsum deposits, which had not previously been mapped. Several new occurrences were found and mapped on a scale of 1:10,000. Gypsum occurs in the Eocene brown clays immediately below the White Limestone. At this horizon, however, it seldom forms beds, but is demarcated through the clay which, in several localities, also contains pseudomorphs of halite. The largest gypsum deposits are associated with the older Purple Conglomerate series, and there are indications that they have been squeezed upwards from some more deep-seated horizon. Evidently this movement has always taken place along thrusts and other lines of weakness. Near Gordon Town, for example, a gypsum body about 60 ft. wide has been squeezed up between beds of the Purple Conglomerate and Carbonaceous Shale Series. In another locality, quite a large hill has been formed by an upthrown body of gypsum with a thickness ranging from 40 to 200 ft. The largest deposits known in Jamaica occur near the eastern boundary of St. Andrew, where gypsum is exposed on a hillside from 1,500 to 500 ft. above sea-level. The lower part of this outcrop is already being worked by two companies, both for the local production of building materials and for the export to cement factories.

Occurrences of several types of iron-ore have been reported, but so far, there have apparently been no attempts to exploit the resources of ferriferous minerals. Zans has found and mapped deposits of magnesite associated with the base of the extensive Newcastle Porphyry Sill

on the North-West slope of Good Hope Mountains near Stafford Hall, St. Andrew. Another lode from 10 to 16 ft. thick was found near Gordon Town and has been traced for some 150 ft. Two deposits of haematite have also been mapped. In one of them haematite with some magnetite occurs in the junction between a schistose complex and an extrusion of andesitic porphyry near Morces Gap. The main lode is 8 or 9 ft. thick and is flanked by smaller parallel lodes. Iron-ores also occur in the Swift River area and in the Port Royal Mountains, while quite large beach placer deposits of magnetite with some ilmenite occur as black sand at several places along the south coast.

The reported occurrence of a block of pyrolusite in porphyry near Marshall's Hall, Portland, was investigated by the Government Geologist who confirmed its presence and also found a smaller vein of the same mineral. Attention has also been devoted to limestone for cement manufacture and to an occurrence of bentonite clays.

FURTHER EXPLORATION OF COPPER DEPOSITS NEEDED

Though previous attempts to exploit the island's known copper deposits have been unsuccessful, Hose points out (*Colonial Geology and Mineral Resources*, Vol. I, No. 1) that when the various mines were in operation, only the higher grade-ores could be sold to smelters. It is possible that systematic exploration might reveal some low-grade deposits capable of economic development by modern mining methods and concentrations. This work has yet to be undertaken, but assistance was given to a U.S. businessman who has carried out detailed prospecting in the old Hope lead and zinc mine.

Although much time was necessarily occupied by *ad hoc* investigations urgently needed by local authorities, encouraging progress has also been made in the detailed mapping of the Kingston area and the examination of the island's mineral resources. In October, 1950, however, following a visit from the Director of Geological Survey of British Guiana, it was decided that the programme of work should be altered because of the urgent need for geological help in improving Jamaica's water supplies. Most of the rainfall disappears underground, resulting in a severe shortage of water, which in some karst areas is seasonal and in others continues throughout the year. It was hoped, therefore, that the deficiency of surface-water could be made good from underground sources.

Work in the Kingston area was accordingly postponed, mapping being transferred to an area embracing the parishes of Trelawny and St. James. It is in the former parish that the most severe shortage of water occurs. The area now being mapped is not rich in mineral resources other than *terra rossa* bauxite, but phosphate-caves have been explored and their content of batguano estimated. Deposits of wad and bog iron ore have been discovered and are being explored. An investigation has also been carried out on asbestos and talc deposits in the serpentine belt of St. Thomas, on the southern slopes of the Blue Mountain Range.

MINERALS VESTING LAW

In view of the potential importance of Jamaica's mineral resources—particularly bauxite—it was considered expedient to control their disposal and use. On August 30, 1947, the Government enacted the Minerals Vesting Law, under which all deposits of metalliferous minerals, various non-metallic minerals, and all precious minerals and metals are vested in the Crown. The only exceptions are gypsum, phosphates, building and other constructional materials, and a few miscellaneous materials. Mineral oils had already been vested in the Crown by the Petroleum Production Law, 1940. The vesting laws provide for the

landowner to receive 5 per cent of the royalties on minerals raised on his land. In September, 1947, the Mining Law 1947 and the Mining Regulations were passed. They provide for the granting of prospecting rights, exclusive prospecting licences, and mining leases.

Vanadium

By LESLIE BOR, M.Sc., Ph.D.

Vanadium, one of the lesser known metals, finds its major application in the steel industry. About 95 per cent of the world production of 3,000 to 4,000 tons is used in ferro-vanadium alloys which are characteristically tough, resilient steels even though less than 1 per cent vanadium is generally present. Vanadium-containing steels are required for tool manufacture, springs, armour plating, rail and train parts. Some 2 per cent of the total vanadium produced is alloyed with various non-ferrous metals—copper and aluminium principally—whilst the remaining 3 per cent is taken up by chemical, ceramic and sundry industries.

Although vanadium ores might be considered strategic from the military viewpoint, several of the major powers are dependent chiefly upon domestic sources of supply. This situation has come about because, in addition to the primary geological vanadium ore deposits, the metal can be recovered as a by-product during the metallurgical extraction of some other metal or from a number of fuel soots. Vanadium ores occur as primary minerals in igneous rocks or their naturally concentrated derivatives, as secondary enriched ore deposits, or in carbonaceous accumulations. The secondary enriched ore deposits of Colorado and Utah were primarily responsible for the tremendous spurt in U.S. vanadium production between 1941 and 1945 when the lead in world vanadium production was taken from Peru. Some 200 producers were mining vanadium ore in Colorado and Utah during 1943; phosphates and uranium were concentrated along with the vanadium. The carbonaceous vanadium deposits (consisting mostly of Petronite VS₃) of Peru have annually given rise to upward of 30 per cent world production, practically all of which has been shipped to the U.S. The well-known ore body at Minasragra is worked in two open cast pits, and after leaching, the concentrates are carried by rail to Lima. Rhodesia, South West Africa, Mexico, French Morocco, Argentina and Spain all produce vanadium in varying amounts.

RECOVERY FROM INDUSTRIAL WASTE

During the recent war Germany and Italy were able to draw all their vanadium requirements from industrial waste material. Germany made use of the Lorraine blast furnace slags, whilst Italy utilized the soot from oil-burning ships and industries. It has been found that Venezuelan and Mexican oils are relatively rich in vanadium ash. Russia, it is reported, possesses vanadium resources, possibly greater than either the Peruvian or U.S. deposits. In any event it would appear that although vanadium is a strategic material, the great powers each have secured sources of supply.

The U.S. is reported to control about 75 per cent of world vanadium production including deposits in Peru, and South West Africa. The United Kingdom is amply supplied by resources located in Rhodesia and South-West Africa. Vanadium from Rhodesia derives from the large zinc deposit at Broken Hill where a ferro-vanadium plant has been in operation since 1930. The vanadium ore from Otavi, South-West Africa, was formerly shipped to Germany, but now comes to Britain. Other European states, however, are dependent upon imported ferro-vanadium alloys for steel and machinery making.

The Lambton Worm—A New Tipping Device

Target, a monthly bulletin on productivity, gives prominent mention in a recent issue of an underground tipping device named the Lambton Worm. As is the case with many of the inventions developed by the engineers of all callings, the Lambton Worm initially was the product of an accident. It was conceived and has been installed at Lambton D Colliery, Fence Houses, Co. Durham, with the result that the coal excavated from two seams is transported to the haulage shaft on a single conveyor. A set of 55 tubs, each capable of transporting a coal content of 8 cwt., can be emptied in 50 seconds with no time lag for uncoupling and with the only manpower necessary a hauling engine driver responsible for the entire operation. The time-maximum necessary to empty and return a set of 55 tubs is two minutes and an average of 12 sets per day are being emptied, presenting an overall production figure for the seam area of 264 tons of coal.

Since its installation six months ago, the Lambton Worm has been in continuous operation throughout all working shifts and has needed no repairs or alteration. Comparative values can be assessed by a survey of old methods of tipping utilized in the same ground block area. Formerly tubs were hauled to the shaft bottom before being trans-

ferred to the cage and raised to surface. It is conceivable that the transferring of the coal from one seam to another could have been accomplished by normal tipping methods. The operation would nevertheless have occasioned an uncoupling of each of the possible 60 tubs from the set, thus demanding the employment of five men.

The method currently in use tells that as tubs run into the Worm tipper they are turned over, projecting their coal content into the mouth of the drift and then righting themselves as they advance. The coal slides down the drift to a belt conveyor in the seam below and the complete set of emptied tubs is run back through the tipper to return to the coal face for reloading.

Construction of the device was begun in a drift 90 yd. in length, 6 ft. high and 8 ft. wide, set at a 52 deg. incline as a connection between the two seams. The termination of the drift came in a 14 yd. hopper immediately below the tipping structure. By means of rails and guides with protective brick walls a 20 yd. structure was built within a roadway 12 ft. wide and 7 ft. in height which was found to be sufficient to instal the Worm tipper and to allow 2 ft. for a travelling road alongside. The main structure of brickwork with girders built vertically into the side walls is next to the travelling road, with the girders fastened to the arch girders at the top. To carry the side of the tub,

flat iron $\frac{1}{2}$ in. x 4 in. was utilized and rails of 28 lb. per yd. support the tubs when the position of support is reached.

A particularly pleasing feature is the water sprays that serve a dual purpose in that they suppress dust and in addition lubricate the rails to facilitate motion of the tubs. At the tipping point the rails supporting the side of the tub are at 80 deg. from the horizontal. They gradually level out to the horizontal again.

Experiments with tubs on the surface proved that with standard crook and link coupling each tub could be turned at an angle of 30 deg. to its immediate predecessor without any undue strain being placed on the coupling.

With a line of six tubs it was discovered that the first would be standing upright on the rails with the sixth completely inverted and the intermediate tubs partially inverted at varied and regularly increasing angles. The length of a tub with fully extended couplings was 5 ft., thus necessitating an overall length of 30 ft. for the commencement and completion of a turning motion for a small set of six tubs. In actual underground practice, this overall was extended to 40 ft. and 80 ft. was allowed for the set to commence inversion, empty itself, and return to the perpendicular on the rails. The tubs do not make a complete turn when run over the Lambton Worm tipper.

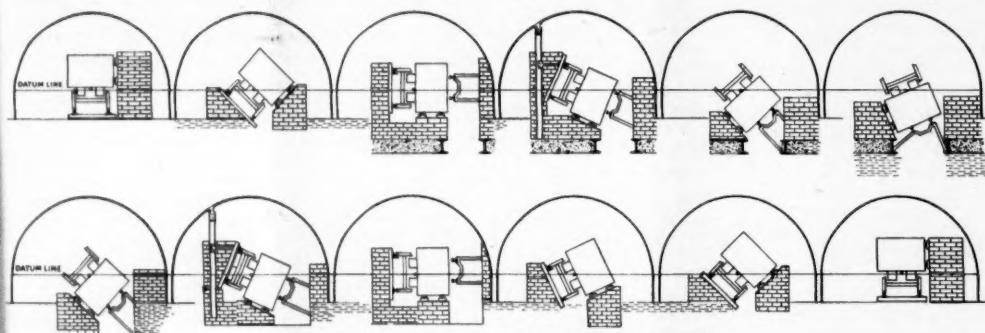


Diagram showing how the Lambton Worm Tipper works

As the method of haulage is by rope, a straight line of pull is necessary to avoid placing an abnormal strain on the couplings. The tubs are therefore turned about the centre line made by the rope, the tub drawbars, and the couplings. To complete the entire process, the rails supporting the side of the tub are curved to start the tub turning back to its normal upright position and a V-shaped guide returns the wheels to the rails.

The Lambton Worm tipper is named after a fabled dragon of the district and was conceived when officials of the colliery were faced with a production problem some time ago. In order to make the main coal seam yield more economically, it was decided to eliminate the long double-haulage system from coal face to shaft, with resultant increased output as well as saving of time and the elimination of a great deal of handling. It was planned also to transfer coal from one seam with a main and tail haulage system to a lower seam where a belt conveyor system was in use.

The solution came by accident when the colliery manager came on a train of piled up tubs underground. The tubs at each end were still on the rails but a number of the intermediate tubs had overturned without having broken loose from their couplings.

MACHINERY AND EQUIPMENT

Experiments With New Hydraulic Pit Prop

According to a recent statement by Mr. H. E. Collins, production director of the Durham division of the National Coal Board, experiments are to be made at Dawdon colliery, County Durham, with a new type of hydraulic steel pit prop of German design which will contribute towards greater safety in mines. Delivery of the props is expected in about a month. The great advantage of the new prop is that it can be moved forward at the coal face without being knocked out and reset.

Flameproof Couplers

An attractive pamphlet published by Messrs. B. I. Callender's displays the manufacturer's range of bolted flameproof couplers and contains details of two couplers specifically designed for underground use. The bolted flameproof cable coupler assembly by BICC mining type capacitor is shown as a compact and complete product, while the bolted flameproof tee assembly mining type capacitor is photographed connected in circuit without alteration to the cable run by means of a tee assembly. This assembly itself comprises a tee box and two half-couplers connected to the terminal adaptor.

This complete notification of later trends in bolted flameproof coupler manufacture, is important in an industry where the engineer's constructive genius turns increasingly towards intensified mechanization and the energy that gives it life. Electrical power is the accepted answer to the problems of transport, motivating force and illumination throughout mining industries the world over.

An additional fillip is given by the realization that the underground type units mentioned can be made and sealed with hot-pouring compound at any convenient point and the necessity for the transport of hot compound underground is avoided.

B.T.H. Illuminates Turkish Coal Mines

Further details have now been received concerning British Thomson-Houston's delivery of more than 700 flame-proof underground mining units and 3,500 flameproof fluorescent lighting fittings to the Eregli coal mines of Turkey, which was referred to in our issue of February 15.

This installation of electrical power and lighting equipment, which will provide one of the most extensive underground lighting systems in the world, was undertaken by B.T.H. engineers on the site. The project is reported to have been successful not

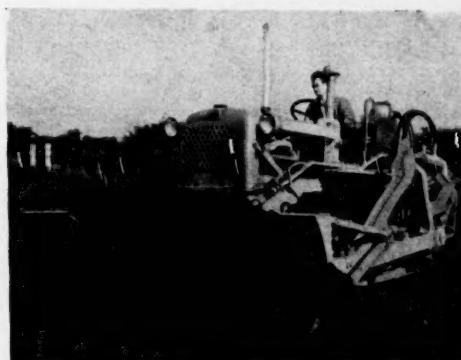


B.T.H. flameproof fluorescent lighting fittings installed in the Eregli coalfields in Turkey

only in its technical aspects, but also in creating the miners' enthusiasm for this type of lighting. Some idea of the difficulties confronting the B.T.H. engineers on site may be gathered from the fact that Turkish miners had very little knowledge of electricity or mechanics and at the outset there was only one item of electrical equipment of 550 volts in the mine.

Fiat and Mackay New Tractor Angledozer Combination

An application that augurs well for the surface earth-moving demands of the mining industry is the Mackay Angledozer, especially designed for utilization with the Fiat crawler tractor Model 55. The manufacturers are confident that the essentials of an efficient hydraulic angledozer have been met, in that the Mackay is possessed of an even load distribution, ease of operation and a trouble-free hydraulic system, as well as being silent in running.



The Fiat Tractor Model 55 with Mackay Angledozer

The combined machine seems destined to be of distinct value to the mining industry in the accomplishment of such tasks as clearance of dump tracks, the elimination of minor dumps themselves, and in general waste stacking. The blade is 31 in. in height and 112½ in. in length; it can be raised 31 in. above the ground and is able to be dropped 13 in. below ground level. Its maximum tilt is 20 in. and its maximum roll 20 degrees. The delivery angle is a regular 65 degrees.

The blade is carried in the centre by a swivel joint and at the sides by torque tubes which are set by screw adjustment for tilt or roll requirements. Rapid angling is accomplished by the removal of two pins, while control is by a spring loaded piston type valve that is housed in a cast body and is protected by seals. Of particular interest is the positive positioning of the oil ways in the piston, which in relation to the ports, ensures a maximum flow of hydraulic fluid and creates an easily operated valve which eliminates jamming. The overall length of the Mackay Angledozer is 147 in.

The other component of the blended machine, the Fiat Crawler Tractor Model 55, is one of the latest products of the Fiat factory at Turin and is a joint successor to the older models 50 and 52. The new Model 55, however, is able to develop an increased power over that of its predecessors owing to the fact that it is installed with a Fiat engine in place of the original Saurer. This new engine unit develops 55 b.h.p. and gives to the tractor belt horse power of 50, a drawbar horse power of 45, and a maximum drawbar pull of 12,125 lb.

The Fiat engine itself is a four-cylinder, four stroke overhead valve direct injection diesel unit with replaceable wet liners and renewable steel backed lead bronze shell type big end bearings. Starting is effected by means of a two-cylinder 10 h.p. auxiliary petrol engine, which in turn warms the main engine through the common cooling system. There are several facets of engine construction which facilitate maintenance and the incorporation of a Fram replaceable cartridge filter and an automatically cleaned edge type metal oil filter contribute to long engine life.

Multiple disc type steering clutches actuated by the manipulation of a steering wheel give a more natural control than the traditional clutch lever and simultaneously lend adequate support to the operator when the Model 55 is employed on uneven ground.

METALS, MINERALS AND ALLOYS

Those who turn to the report of the U.S. Munitions Board in order to crystal-gaze for the future are likely to be disappointed. President Truman wants the value of the stockpile to reach \$5,000,000,000 by June 30, 1953. Stocks on hand at the end of 1951 totalled \$3,440,000,000 but contracts outstanding at the time for future deliveries covered materials worth \$2,209,000,000. Stocks and the unexpired contracts together were therefore worth more than the President asked for by the middle of next year. Obviously, the unexpired contracts relate to a period extending beyond June, 1953. Four questions arise. The first is what percentage of the difference between stocks on hand and the June, 1953, objective, namely \$1,560,000,000 is not already covered by unexpired contracts and will, hence, add further pressures to those already known. The second is how determined the Munitions Board will be in absorbing stockpile commodities in the face of commercial shortages. The third question is whether and to what extent, the Board will repeat its previous actions by releasing stocks for commercial operations. In the second half of 1951, such releases included 55,000 s.tons of copper, 10,000 tons of aluminium and 30,000 tons of lead. The fourth question concerns the variations which the Board might make by following precedent and altering the objectives now set out. The answer to these questions are highly important to all engaged with commodities. But not even the Munitions Board knows all those answers, for it will have to continue adopting its policy to changing circumstances.

COPPER.—The Chilean Finance Minister is quoted as stating that the Chilean government is negotiating for the sale to North American producers of the 20 per cent of her output, which under the I.M.C. agreement she may sell on the free market. Price mentioned is 33½c. against the official U.S. price of 27½c. No confirmation of this is forthcoming from the companies concerned and it is open to doubt whether U.S. traders would pay this price for additional supplies. If there is any substance in the report, it is an indication of the trend in the free market price, for as recently as last week, Chile was reported to have sold some 4,000 tons to Germany at around 40c. per lb.

LEAD.—With the suspension of the U.S. Import Tariff on lead and the consequent availability of foreign lead at 19c. ceiling, the improvement in the position of supplies of lead has enabled N.P.A. to remove all restrictions on its use in the U.S. Consumers may now hold stocks equal to 60 days' supply instead of the previous 30 days'. Although allocations to consumers will continue, they will be on a quarterly basis in lieu of the current monthly allocation, and in the single month of March consumers can buy their lead allocation forward for the whole quarter. Relaxations in the use of lead for storage batteries and other purposes are also foreshadowed.

According to the Minister of Supply remelted and scrap lead supplies are sufficient to meet all demands from the consuming industries. The Minister consequently removed price control from these materials. So far no decision has been published on the question whether to permit the re-opening of dealings in virgin lead on the Metal Exchange.

The slight recovery recorded last week in the average price of Mexican lead, f.o.b. Monterey, has since been lost—and more besides. The latest price of 18.38c. per lb. compares with 18.75c. in the previous week, and 18.68c. per lb. a fortnight earlier. This week spot lead f.a.s. Gulf ports was quoted fractionally lower at 19c.

A misprint in last week's report of the U.K.-U.S. lead deal created the impression that a total of 60,000 tons of lead was involved. This is not so. Of the 30,000 tons to be sold to the U.S. over the next four months, 20,000 tons are understood to be coming from Australia and 10,000 tons from Canada.

TIN.—In Parliament last week the Government spokesman on the U.S.-U.K. tin deal did not appear to be very optimistic over the outcome of the arrangement. It is true that he warned Members that it was impossible to say what the final outcome would be. But he prepared for the worst by saying that if a

cash loss were suffered, it would be more than compensated by the steel side of the agreement.

The supplementary estimate for the Ministry of Materials assumes that 4,000 tons under the deal will have been delivered and paid for by the U.S. at March 31. Beyond this, the estimate allows £4,092,000 to cover further deliveries and afloat for which the U.S. would not yet have paid at the end of the financial year.

Malayan output of tin concentrates for January was 4,743 tons (compared with 4,989 in December). Indonesian production in January was the lowest for nearly four years at 1,965 tons (2,940) while production in the Belgian Congo was 1,156 tons (1,213).

ZINC.—European smelters, some of whom have recently been raising their returning charges, are now thought to be working somewhere near capacity and to be experiencing no shortage of ore. Further expansion of slab zinc production must therefore depend on increased output from American smelters, which should be assisted by the recent suspension of the U.S. Zinc import duty. Foreign demand for Mexican Prime Western has broadened and was around 22c. f.a.s. Gulf Ports, at the beginning of this week. It will be recalled that Mr. Wilson, the director of Defence Mobilisation, recently forecast that present expansion projects for zinc production are expected to add about 150,000 to U.S. production by 1953, as compared with last year.

As was to be expected, U.S. shipments of galvanized sheets in 1951 showed a decrease over 1950 largely in consequence of the N.P.A. cuts in zinc allocation to galvanizers last year. Production in 1951 totalled 1,984,961 tons, against 2,262,041 tons in 1950.

U.K. PRIMARY METAL STATISTICS—DECEMBER (long tons)

	Refined Copper	Lead †	Slab Zinc	Tin Metal
Stocks in U.K. Dec. 1				
Government	62,072	34,718	20,170	200\$
Consumers	31,780	21,938	11,253	4,011
Imports				
December	18,563	27,143	16,851	1,613
Total, 1951.....	224,715	174,663	122,033	10,912
Production				
December	10,983	5,798	5,827	2,740*
Total, 1951.....	129,647	73,609	69,734	26,050*
Consumption				
December	26,371	15,506	16,528	1,719
Total, 1951.....	330,341	232,122	188,177	23,892
Exports & Re-exports				
December	70	101	Nil	286
Total, 1951.....	468	637	28	5,840
Stocks U.K. Dec. 31 ‡				
Government	58,608	53,362	26,340	200\$
Consumers	28,643	23,805	13,319	4,904

(Source: British Bureau of Non-Ferrous Metal Statistics)

* Estimated by International Tin Study Group.

† Includes imported virgin lead and English refined from domestic ores and from secondary metal.

‡ Excluding strategic reserves.

|| Including tin in official warehouses but excluding smelter carry over.

‡ In addition U.K. stocks of blister copper at the year end were 26,108 tons; of zinc concentrates were 38,593 tons and of tin in ore were probably about 2,000 tons.

ANTIMONY.—In order to exploit the antimony deposits at Zajaca in Yugoslavia, estimated at 150,000 tons, new machinery is to be installed. Already Yugoslavia claims to be Europe's greatest producer of the metal.

Although the U.K. price remains unchanged at £365 per ton, the metal is being freely offered on the Continent by Czechoslovakia and Yugoslavia at £20 per ton below this price.

CHROME.—South African Railways is reported to have cut the allocation of trucks to the chrome mining companies by 20 per cent to 37½ per cent.

GOLD.—Western Australian gold output in January amounted to 56,145 f.oz.

The London Metal Market

(From Our Metal Exchange Correspondent)

The drifting tendency continues and it is not expected that the market will develop any definite trend until the news from America becomes more definite. It appears that the Indonesians are prepared to sell approximately 20,000 tons of tin this year at the same price as the Americans are paying the British, but they wish this to be coupled with a firm sale of a further quantity over the following two years, and it is the pricing of this quantity which is understood to be causing the delays. It is now fairly definite that the British Government are shipping about 6,000 tons of tin from the U.K. before the end of the first quarter, but it is still not known whether they have commenced accumulating additional tonnages for later delivery.

The price trend in the other metals continues with buyers becoming more reserved, and there are sellers of g.o.b. zinc at under £200 per ton, c.i.f., of lead at £165 per ton, c.i.f., whilst the copper market also shows signs of falling, but in this case there are still isolated buyers of small lots who have not yet reduced their bids.

The general lead situation has now reached a stage where the American authorities have raised their restrictions on the "end use" of the metal, have allowed inventories to be increased to 60 days' supply, and are examining the possibility of doing away with the allocation system for some, if not all, of the more important branches of the trade.

On Thursday the official close on the tin market was: Settlement price £974 10s., Cash Buyers £974, Sellers £975; Three months' Buyers £974 10s., Sellers £975 10s. In the afternoon the market was steady. Turnover for the day was 75 tons. Approximate turnover for the week was 570 tons. The Eastern price on Thursday morning was equivalent to £984 10s. per ton, c.i.f. Europe.

Iron and Steel

Although Mr. Steven Hardie's disclosure of the decision of the Minister of Supply to increase steel prices was somewhat irregular, he betrayed no profound secret. All that has emerged from the published correspondence between the chairman of the Iron & Steel Corporation of Great Britain and the Minister of Supply and the subsequent debate in the House of Commons confirms the previously accepted view that British steel prices were bound to rise and an Order, duly signed by the Minister, authorizing an advance became operative on Wednesday last.

The figures cited by Mr. Duncan Sandys are certainly convincing. He estimates that the increased costs to be borne by the industry during the current year will amount in the aggregate to £75,000,000.

An authorized increase in steel prices of about £4 per ton is expected to yield £56,000,000 leaving a balance of £19,000,000 to be met out of the earnings of the steel industry. It appears to be a fair and reasonable adjustment which was approved by a majority vote of the Corporation and endorsed by the Cabinet. Indeed, the blunt comment of Sir John Green who has succeeded Mr. Steven Hardie as chairman of the Iron & Steel Corporation is that "prices should have gone up months ago."

The new maximum quotations are still below the general level of Continental and American prices and are not expected to lessen appreciably the demand for British steel in either the home or foreign markets.

Here are some typical examples of the latest increases issued by the Ministry of Supply:

	Former price Per ton	New price Per ton
Basic pig iron	£11 15 6	£12 10 0
Soft basic billets	£21 11 6	£25 4 6
Sheet and tinplate bars	£21 16 0	£25 3 6
Heavy sections	£23 15 6	£27 17 0
Plates (N.E. Coast, etc.)	£25 6 6	£29 14 0
Light sections	£27 1 0	£31 5 6
Bright steel bars	£37 6 9	£42 7 3

Advances of such proportions, following closely upon the steep rise in prices which was imposed in August last will have a profound effect on production costs in all the steel using industries. Nevertheless, the chief concern of engineers, ship builders, and other large and small consumers is the procurement of adequate supplies. Shortages are immediate and acute. As the year advances easier conditions are expected to develop, and allocations may be increased.

Favourable factors are the slow but steady expansion of pig iron production and the acceleration of imports of steel semis from France, Belgium and Germany. These promise to reduce the difficulties of re-rollers whose mills have recently been working very irregularly through lack of material. Blast furnace men are well supplied with home and foreign ores but the shortage of scrap is a continuing anxiety.

FEBRUARY 28 PRICES

COPPER		
Electrolytic	£227	0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid	£170	0 0 d/d
Soft empire, including secondary lead	£170	0 0 d/d
English lead	£171	10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid	£190	0 0 d/d
G.O.B. spelter, domestic	£190	0 0 d/d
Electrolytic and refined zinc	£194	0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over	£365	per ton
Crude (70%)	£290	per ton
Ore (60% basis)	42s. 6d./47s. 6d. nom. per unit, c.i.f.	

NICKEL

99.5% (home trade)	£454	per ton
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OTHER METALS

Aluminium, £148 per ton.	Palladium, £8 10s. oz.
Bismuth, 28s. lb.	Platinum (scrap), £33.
Cadmium, 18s. 9d. lb.	Platinum, £27/33 5s. nom.
Chromium, 6s. 3d. lb.	Rhodium, £45 oz.
Cobalt, 20s. lb.	Ruthenium, £30 oz.
Gold, 248s. f.oz.	Quicksilver, £73 10s./£74 ex-warehouse.
Iridium, £65 oz. nom.	Selenium, 25s. nom. per lb.
Magnesium, 2s. 10½d. lb.	Silver (bar), 77d. f.oz. spot and forward.
Osmiridium, £35 oz. nom.	Tellurium, 19s. lb.
Osmium, £70 oz. nom.	

ORES, ALLOYS, ETC.

Bismuth	30% 12s. 9d. lb. c.i.f. 20% 10s. 3d. lb. c.i.f.
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Chrome Ore—

Rhodesia Metallurgical (lumpy)	£13 per ton c.i.f.
" (concentrates)	£13 per ton c.i.f.
" Refractory	£12 12s. per ton c.i.f.
Baluchistan Metallurgical	£14 16s. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Molybdenite (85% basis)	10s. 1d. per unit c.i.f.
Wolfram (65%), U.K.	48s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture)	35s. nom. per lb. (home)
Ferro-tungsten	33s. nom. per lb. (home)
Carbide, 4-cwt. lots	£30 3s. 9d. d/d per ton
Ferro-manganese, home	£43 7s. 5d. per ton
Brass Wire	2s. 7d. per lb. basis.
Brass Tubes, solid drawn	2s. 1d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

In general, this was another bad week for markets. Gilt-edged were all down on last week's level, two contributory factors being the increase in the rate of loans to farmers and the postponement of the budget. There has been some talk of dearer money, it is even predicted that another increase in the bank rate is imminent. Moderate opinion, however, considers this unlikely as Mr. Butler, on taking office, stated that his plan was to allow his dearer money measures to percolate through the system. This has already been accomplished to an astonishing degree. The present level of gilt-edged stocks is the lowest since 1932. There were some signs of a rally towards the close of business on Wednesday.

The main feature was the continued heavy fall in commodity shares. Lead/Zinc issues were particularly hard hit. There are definite signs of a weaker position in both metals. Jobbers report some selling of Barriers with the object of switching into gold shares.

Tin issues also fell away in both the Eastern and Nigerian sections. The market finds the metal position here rather difficult to assess but the general fall of commodity price levels, which was again started by rubber, caused marking down of prices and some selling.

Coppers were also carried along with the stream. The metal position here is, of course, much stronger, and informed circles still consider the lower price levels unwarranted. The hurried liquidation of speculative positions in the market, appears to have considerably hastened the fall.

While oil shares were uninfluenced by the unpopularity of commodities, the main reason for their fall was the adjustment of the yield basis. Until recently, these shares gave a return of around 5 per cent, whereas it is now possible to obtain rather more than 6 per cent in first class industrial shares.

The whole market has been influenced by the recent fall on Wall Street. Diminished demand for consumer goods in America may have started the decline. It is difficult to assess whether or not this trend is likely to be prolonged, as there is

usually a seasonal decline in trade about this time of year. America is now such a wealthy country that it can afford to indulge in a high demand for consumer goods. When this eventually falls off, commodities will find themselves in a difficult position.

To set against the gloomy side of the picture, gold shares acquitted themselves well. Kaffirs sprang into the lead, assisted by further reports of increased uranium production from certain Rand mines, and the West Rand Group was again particularly favoured. The possibility that costs are near their peak, as mentioned here last week, and the gradual fruition of plans to increase mechanisation on the Rand, stimulated interest in the shares.

Doornfontein, as a developing mine, attracted special attention and the shares were a strong market. The Annan shaft was sunk to its final depth during the December quarter. It is hoped that encouraging development results may be announced during the next few months.

The O.F.S. market, while generally better, was more restrained than the Rand. In this connection, views expressed recently by Mr. Annan in the financial press are interesting. He is reported as saying that in his opinion the O.F.S. market requires rather less capital for development than has been estimated in London, since many leading finance houses have for some time been ploughing back profits into this field.

Virginia Gold report low values from their No. 2 shaft area. At a depth of around 3,180 ft. below the collar, nine sections were sampled, giving average values of 69 in.-dwt. At 3,191 ft. complete exposure of the reef in a winze gave values of 100 in.-dwt. Ground in the winze was found to be faulted, causing duplications of the reef. The shares eased following this announcement.

Both Australian and West African gold shares improved although the latter are not fully indicated in the price list below. The Gold Coast Selection Trust Group were favoured following encouraging quarterly results.

FINANCE	Price Feb. 27	+ or - on week	O.F.S.	Price Feb. 27	+ or - on week	MISCELLANEOUS GOLD (contd.)	Price Feb. 27	+ or - on week	TIN (Nigerian and Miscellaneous)	Price Feb. 27	+ or - on week
African & American Corp.	3		Alpha F.S.A.	7/8		G.F. Rhodesian	7/8	- 7/4d	Amalgamated Tin	10/11	- 4/4d
Anglo-American Corp.	7 1/2		Blinkpoort	20/-		London & Rhodesian	5/6	- 6/1d	Beralt Tin	22/	- 9d
Anglo-French	21/3		Central Mining F.S.	4/- x 4s		Motapa	2/3	- 3/1d	Bischi	4/-	- 3d
Anglo Transvaal Consol.	37/6	- 2/6	Fredries	9 1/2	+ 3d	Mysova	4/9	- 3/1d	British Tin Inv.	17/3x3d	- 3d
Camp Bird	12/4		Fredries	8/3	- 1/4d	New Guinea	1/6	- 1/4d	Ex-Geover Tin	6/1	- 3d
Central Mining (Pty) Ltd.	50/4	+ 1/10d	Hendersons S.	9/3	- 1/4d	Sundydroog	5/8	- 1/4d	Geover Metal	16/-	- 3d
General Proprietary	50/4	+ 1/10d	H.E. Geduld	5/1	- 1/4d	Oruveli	2/1	- 1/4d	Jantar Nigeria	4/3	- 3d
Consol. Mines Selection	32/6	+ 1/10d	Groefries	2/2	+ 6d	Oroville	12/3x3d	- 1/4d	Jos Tin Area	6/1	- 3d
East Rand Consols.	3/4d		Harmony	20/- xR	- 1/4d	St. John d'El Rey	32/6	- 1/4d	Kaduna Prospectors	4/3	- 1/4d
General Mining	41		Lydenburg Estates	11/-	+ 6d	Zans	40/9x4d	- 6/1d	Kaduna Syndicate	5/7d	- 1/4d
H. E. Prop.	36/3	- 2/6	Middle Witte	20/-					London Tin	6/1	- 1/4d
Henderson's Transvaal	14/3		Osifits	46/10 1/2	+ 1/10d				Ribon Valley	1/3	
Johnsons	36		Prestwich Brand	15/6	+ 1/4d				United Tin	2/10d	- 1/4d
Land Mines	5 1/2		President Stey	21/-	+ 6d						
Rand Selection	43/9		St. Helena	7/9							
Union Corporation	91		U.P.S.C. & G.	7/9							
Vereeniging Estates	4 1/2		Virginia Deb.	73							
Wrists	38/10 1/2	+ 1/10d	Virginia Ord.	11/9							
West Wits	48/9	- 2/6	Welkom	33/9							
BAND GOLD			Western Holdings (New)	3 1/2							
Blyvooruits	43/9										
Brakpan	19/9		WEST AFRICAN GOLD								
City Deep	44/4		Analagamated Banket...	1/9							
Consol. Main Reef	43/9		Ariston	1/3							
Crown	3 1/2		Ashanti	24/7 1/2	+ 1/4d						
Daggas	34/6		Barman	8/1 1/2	+ 1/4d						
Durban Deep	2 1/2		Brennan	2/9							
Dunbaron Reefs	28/4		G. C. Main Reef	3/3							
Durban Deep	3/6		G. C. Selection Trust	7/3							
E. Geduld	47/6		Londonderry	2/10 1/2	+ 1/4d						
E. Rand Props.	3 1/2		Lu旺duh Deep	1/1 1/2	+ 1/4d						
Geduld	6 1/2		Martu	1/9							
Grootvlei	17/3		Nutras	5d							
Laundera Vlei	20/		Taquaah & Abosso	5/-							
Marievale	23/3										
Modderfontein B.	5/4d		AUSTRALIAN GOLD								
Modderfontein East	31/3		Boulder Perseverance	2/9							
New Kleinfontein	35/-	+ 1/10d	Gold Mines of Kalgoorlie	12/-	+ 1/4d						
New Pioneer	15/3		Great Boulder Prop.	6/6	+ 3d						
Randfontein	23/		Great Western Consol.	5/9							
Randfontein	14/-		Lake View and Star	18/9							
Rose Deep	35/-		Morgan	17/-X	+ 3d						
Sinner & Jack	7/3		North Kalgoorlie	15/9	+ 6d						
Springs	10/4		Parings	6/9							
Sub Nigel	2 1/2		South Gwalia	10/9							
Van Dyk	15/-		South Kalgoorlie	9/3							
Venterport	20/3		Western Mining	7/9	+ 3d						
Vlakfontein	19/-		Witwatersrand	5/9							
West Driefontein	28/8		MISCELLANEOUS GOLD								
West Driefontein	6 1/2		Cam and Motor	40/-	+ 3/1d						
W. Rand Consolidated	51/10 1/2		Champion Reef	7/9	- 6d						
Western Reefs	45/-		Clowes & Phoenix	24/-	+ 3d						

COMPANY NEWS AND VIEWS

Messina Expansion Programme

The full report and accounts of Messina (Transvaal) Development for the year ended September 30 last showed that net profit, after providing for all expenses and taxation liabilities, amounted to £1,055,919 against £668,646 in the preceding eight months—the first period covered by the company's incorporation in South Africa on February 1, 1950.

Year to Sept. 30	Copper Revenue	Working Costs	Tax	Net Profit	To Reserves	Dividend
	£	£	£	£	£	%
1951	2,419,953	945,367	390,000	1,055,919	330,000	280
1950	1,447,976	574,754	182,000	668,646	250,000	160

The profit expansion during the year under review was not very large as net profits for the preceding eight months period are equivalent to an annual rate of £1,002,969 and, moreover, were earned during a period when the average price of copper was between £45-£50 less per ton than during the year ended September 30, 1951. But on the other hand, results during that period were greatly assisted by having available a considerable quantity of concentrates which enabled the smelter to produce 9,345 tons of copper, though the 426,680 tons of ore handled by the smelter contained only 7,974 tons of copper. No such surplus was available for the period ended September 30, 1951, and the 11,179 tons of copper produced were extracted from 647,310 tons of ore containing 12,263 tons of copper.

Thus it is apparent that the company's urgent need is for additional concentrator capacity. This need is being met by the erection of a new secondary crushing and screening plant and by the addition of a sixth rod mill. However, these units cannot be brought into operation until after the new 3,500 kW. turbine (which at present is being held up for essential parts) is operating and adequate electric power is available.

During the year Messina acquired the Umkondo claims from the Union & Rhodesian Mining & Finance and an exclusive prospecting reservation over 100 sq. miles surrounding these claims. In order to prospect this area and to finance the extension of the concentrator plant the company is raising £1,200,000 of new funds by a "rights" issue of 300,000 5s. reserve shares at £4 per share in the ratio of three for every 10 units held. This will raise the issued capital from £250,000 to £325,000.

The company's new Artonville property which at the end of September, 1950 was reported to contain 56,180 tons of 6 per cent copper has, after further work, been reclassified as 158,640 tons containing 4.0 per cent copper. Despite the reduction in value it is worth noting that this is still much more than the value of the ore sent from the stopes during the year under review which averaged 2.00 per cent.

The company has declared an interim dividend of 150 per cent (equal to 7s. 6d. per 5s. unit) in respect of the current year ending September 31, 1952.

The annual meeting will be held in Johannesburg on March 11. Commander H. P. P. Grenfell is chairman.

Ariston's Strong Ore Reserve Position

Total tonnage crushed and ounces of gold recovered by Ariston Gold during the year to September 30 last were all time records for the company, giving a gross revenue of £1,322,648 compared with £1,281,667 in the previous year.

Year to Sept. 30	Milled	Grade	Yield	Cost	Available Ore Reserves
	(tons)	(dwt.)	(oz.)	per ton	(tons) (dwt.)
				s. d.	
1950	293,000	7.5	99,721	49 9	2,882,255 6.81
1951	328,000	7.1	103,636*	52 1	2,690,902 6.89

* Additionally, 3,186 oz. were recovered from re-treatment.

† Including development charges.

Unfortunately, rising costs, due almost entirely to the increased cost of power and stores, and the heavier taxation burden which absorbed no less than 62 per cent of the company's profits, resulted in net profit being £94,505 less than in

the preceding year. Consequently, the dividend distribution was reduced by 5 per cent to 25 per cent. To offset the non-recurring benefits obtained during the year for initial allowances in respect of new capital expenditure, tax equalisation reserve received £30,000 bringing that account up to £70,000.

Year to Sept. 30	Bullion Revenue	Mine Costs	Tax*	Net Profit	Dividend	Carry Fwd.
	£	£	£	£	%	£
1950	1,280,771	659,387	246,163	249,542	30	75,793
1951	1,321,318	771,948	177,387	155,037	25	62,892

* Excluding Gold Coast gold duty which amounted to £73,707 (1950—£13,895).

The prospects for Ariston look bright. Ore reserves represent a supply of nearly 8½ years at the current crushing rate and even at the increased milling rate of 480,000 tons per annum, expected to be reached in about a year's time, there is sufficient tonnage for over 5½ years. Accordingly, development work is to be reduced in the current year from an average of approximately 1,400 ft. per month to 250 ft. per month. This will not only reduce development charges but, more important, it will enable the company to concentrate on developing the North ore body where driving on level 24 has proved its downward extension with the consequent indication of a further considerable tonnage of payable ore. This is a development of major importance as much of the orebody above level 20 has been stopeed out. Moreover, premium gold sales are currently bringing in an average of over £4,000 monthly, labour relations remain good and results for the first four months of the current year are very satisfactory, total mine working profit amounting to £191,220.

Continuing Progress of G.C. Main Reef

Although tonnage milled by G.C. Main Reef during the year to June 30 declined by some 4,300 tons the throughput carried a better grade ore which yielded 2,000 more ounces of gold than in the previous year.

Year to June 30	Bullion Revenue	Gross Revenue	Mine Costs	Net Profit	Dividend	Carry Fwd.
	£	£	£	£	%	£
1950	337,370	339,274	262,416	9,937	5	10,045
1951	384,034	390,099	284,627	34,413	5	15,206

Consequently bullion proceeds improved sharply. Costs advanced 8s. 5d. per ton raising mining expenditure by £22,211 to £284,627 but the company was not liable for taxation owing to the incidence of capital allowances and thus this expenditure was easily absorbed enabling the company to reap the benefits of its higher output, net profit being £24,476 higher at £34,413. The dividend was maintained at 5 per cent absorbing £29,252, leaving the carry forward at £15,206 against £10,045 previously.

Year to June 30	Milled	Grade	Yield	Cost	Available Ore Reserves
	(tons)	(dwt.)	(oz.)	per ton	(tons) (dwt.)
				s. d.	
1950	97,944	6.7	28,983	60 3	297,190 8.60
1951	93,609	7.5	30,980	68 8	318,195 8.63

* Including development charges.

Development work carried out during the year on the three sections, Bonday, Tuappin and Ekotokroo were most encouraging, especially in the Bonday section on Level 13 where an ore shoot being developed has to date given the excellent value of 10.99 dwt. per ton over 57.2 in. for a length so far of 165 ft. Ore reserves, notwithstanding the 93,609 tons treated during the year, showed a net increase of 21,005 tons at the fiscal year-end.

The satisfactory trend apparent during the year under review was continued during the first six months of the current year (see the quarterly results given elsewhere in these columns) in respect of which an interim dividend of 5 per cent has been declared.

A further point of interest is the improved liquid position of the company, net current assets standing in the latest balance sheet at £264,155 compared with £242,751—a more favourable position than has prevailed for some years past.

Oroville Dredging Maintains Dividend

The consolidated profit and loss account of Oroville Dredging for the year ended September 30, 1951, including the results of its 99.9 per cent owned subsidiary, the Pato Mines (Columbia), showed a net profit, after providing for expenses, taxation and £21 (£34) attributable to outside shareholders, of £42,745, compared with £68,088 in the preceding twelve months. There was a recovery of £19,410 (£1,890) in respect of shares previously written off and this sum was transferred to investment reserve, which now stands in the balance sheet at £41,410. The dividend was maintained at 1s. 3d. per 4s. share and the carry forward at the fiscal year end amounted to £117,151 against £115,422.

Year to	Dividend	Gross	Tax	Net	Divi-	Carry
Sept. 30	Income	Revenue		Profit	den-	Forward
	£	£	£	£	%	£
1950	133,947	135,631	55,850	68,088	31%	115,422
1951	128,535	133,027	78,571	42,745	31%	117,151

As a holding company the fortunes of Oroville Dredging are dependent upon those companies in which it is interested.

The main investments of the group continue to be the holdings in Bato Consolidated Gold Dredging (99.9 per cent), Asnazu Gold Dredging (41 per cent) and Bulolo Gold Dredging (59.130 C. \$5 shares), the operations of which companies for their last financial year are given in the table below.

Company	Year to	Ground Treated cu. yds.	Yield (000)	Value (oz.)	Dividend C. \$	This Last Year	Year
Pato Consol.	31.12.50	15,230	107,643	4,087,410	20c.	25c.	
Asnazu Gold	31.12.50	6,469	26,080	987,856	15c.	10c.	
Bulolo Gold	31.5.50	12,330	68,189*	2,542,400	75c.	\$100	

* 30,339 oz. silver were also recovered.

Oroville's results for the current year should show an improvement over those of the year under review. For the calendar year 1951 Pato Consolidated reports an increase in the value of its gold production by some \$C.2,000,000 and although the value of Asnazu's production declined by nearly \$C.260,000 during the same period, both companies have declared dividends representing in each case a 5c. per share increase, compared with the corresponding payment in the preceding year. In the case of Asnazu, however, the increased dividend must be set against the fact that rising costs have compelled the company to eliminate approximately 3,500,000 yards of tailings ground and thus may reach the end of its workable reserves within two or three years' time.

Bulolo Gold Dredging for the seven months to December 31, 1951, reports an increase in the value of its production by \$336,805 to \$1,614,025. A dividend of 50c. per share, has already been declared and if the improvement is maintained, a final dividend of 50c. per share appears likely.

Sturzenegger's 21st

Sound and impartial judgement on the individual companies of the Rand, the Far West Rand, and the Orange Free State, is comment worth having whenever and wherever it can be found. This is the real importance and value of Sturzenegger's *The Rand Gold Mines* which has been gaining the confidence of investors, speculators and the merely inquisitive for the last twenty years.

Thus no special introduction is required to announce the appearance of the twenty-first edition of this valuable book, compiled and published by L. W. Parker, 6, Throgmorton Street, London, E.C.2, and priced at two guineas, which includes the service of the issue of four supplements.

What scope there is for criticism is confined to the book's present title, for with the increasing importance of the Orange Free State goldfield, may it not be a useful modification to entitle future editions, *The Rand and O.F.S. Gold Mines*.

Company Shorts

G.C. Selection Trust Group December Quarterlies.—With the exception of Bremang Gold Dredging all the West African gold producers in the Gold Selection Trust group showed higher working profits compared with the three preceding months.

Marlu, whose profit dropped from £15,000 in the June Quarter to £6,000 in the September Quarter, improved its position by £30,000, excluding additional revenue from premium sales. This company also reported that the erection of its new treatment plant was now nearing completion and that operation on a small scale was expected in the near future.

Gold Coast Main Reef announced several good development results, two of which were 728 in.-dwt. and 734 in.-dwt. At Ariston development on the North orebody gave an average of 6.7 dwt. over 115 in. over the total distance of 1,206 ft. exposed by the end of 1951.

Revenue from the sales of gold at premium prices was given in the quarterly reports for the first time and the table below shows working profits for the past two quarters together with the extra revenue received from premium sales in the December Quarter.

Company	Working Profit		Premium		Total	Premium
	Sept. (1951)	Dec. (1951)	Dec. (1951)	Dec. (1951)	as % of total profits	
	£	£	£	£	%	
Amal. Banket	64,682	98,808	11,382	110,190	9.6	
Ariston	118,659	139,384	12,248	151,632	4.2	
Bremang	60,910	51,920	5,268	57,188*	10.9	
G.C. Main Reef	38,613	46,178	4,209	50,387	11.9	
Marlu	6,082	36,076	4,957	41,033	8.2	

*Total does not include £2,195 recovered from a "clean up."

†Including premium revenue.

Seramban.—The profit and loss account of Seramban for the year ended June 30, showed a gross surplus of £710. However, provision having been made in the accounts to meet the British Military Administration's claim of £616 and £158 being required for taxation, the adverse balance at the fiscal year-end was £1,574 against £1,510 brought in. The annual meeting will be held in Redruth, Cornwall, on Mar. 20. Mr. Stanley Wickett is chairman.

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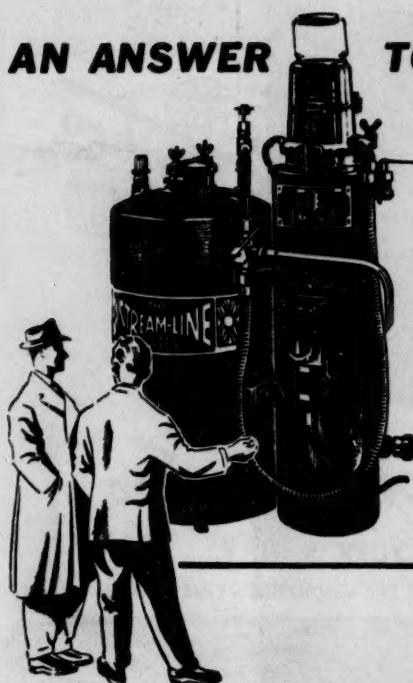
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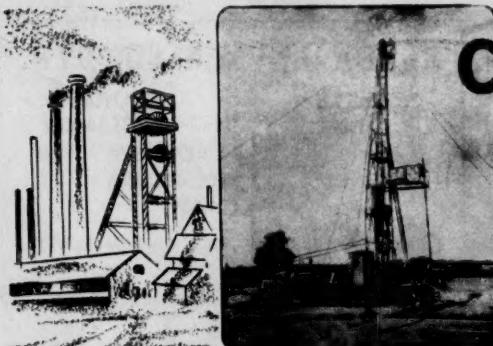


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